Claims

1. (Currently amended) A method ~~of~~ for detecting a bioactive compound or organism, comprising:

providing a capsule comprising chromatophores in a first optical state;

~~exposing~~ introducing the bioactive compound or organism into the capsule to commingle the chromatophores ~~to~~ with the bioactive compound or organism; and

detecting ~~a~~ an optical change in at least one chromatophore from the first optical state to a second optical state in response to the bioactive compound or organism.

Claim 2 (Canceled).

3. (Previously presented) The method of claim 1, wherein the chromatophores are fish chromatophores and an optical change in the at least one chromatophore is selected from a group consisting of pigment aggregation, pigment dispersion, and hue changes.

4. (Original) The method of claim 1, wherein the bioactive compound is selected from a group consisting of neurotransmitters, adrenergic agonists, adrenergic antagonists, seratonergic antagonists, hormones, cytoskeletal inhibitors, cAMP Signal transduction modulators, calcium ion signal transduction modulators, membrane voltage regulators, neurotoxins, protein kinase modulators, caustic irritants, heavy metals, polyaromatic hydrocarbons, organo phosphate nerve agents, psychogenic agents, antihistamines, enzyme inhibitors, algal toxins, bacteria, and bacterial protein toxins.

5. (Currently amended) The method of claim 1, wherein the ~~bioactive compound~~ organism includes a bacteria, fungus, virus, plant, or animal.

6. (Previously presented) The method of claim 1, wherein the chromatophores are Betta chromatophores.

7. (Currently amended) The method according to ~~of identifying a bioactive compound according to~~ claim 1, comprising:

exposing a first type of chromatophore to a sample potentially comprising a bioactive compound or organism;

exposing a second type of chromatophore to a sample potentially comprising a bioactive compound or organism; and

identifying at least one class of compounds ~~based on detected~~ by comparing an optical appearance of the first type of chromatophore and the second type of chromatophore prior to exposure to the bioactive compound or organism and after exposure to the bioactive compound ~~responses of the first and second types of chromatophores~~.

8. (Original) The method of claim 7, wherein the first and second types of chromatophore are melanophores and erythrophores, respectively.

9. (Original) The method of claim 8, wherein the chromatophores are fish chromatophores.

10. (Currently amended) The method of claim 1 useful for identifying a calcium channel blocker, comprising:

exposing an erythrophore and a melanophore to a known calcium channel blocker, thereby producing a known response to the calcium channel blocker;

exposing ~~an~~ the erythrophore chromatophore to a sample potentially comprising a calcium channel blocker ~~and producing an erythrophore response~~;

exposing ~~a~~ the melanophore chromatophore to the sample [and producing a melanophore response]; and

determining ~~if~~ that the sample includes a calcium channel blocker based on ~~the~~ an erythrophore dispersion response and [the] no melanophore response.

11. (Currently amended) The method of claim 1 where the chromatophores have a first color prior to commingling the bioactive compound or organism with the chromatophores

and a second color after commingling the bioactive compound or organism with the chromatophores, the method further comprising:

~~placing one or more color classes of chromatophores in functional contact with the test compound or organism; and~~

~~measuring~~ detecting a color [response] change from the first color to the second color of at least one ~~of the classes~~ chromatophore.

Claim 12 (Canceled).

13. (Currently amended) The method of claim ~~12~~11, further comprising determining if ~~the~~ a test sample includes a compound selected from a group consisting of neurotransmitters, hormones, intracellular signal transduction agents, pharmaceutically active agents, toxic agents, agricultural chemicals, chemical toxins, biological toxins, microbes, and animal cells based on the color [response] change.

Claims 14-24 (Canceled).

25. (Currently amended) The method of claim 1 further comprising:

selecting a ~~test cell~~ bacteria that produces a ~~cell induced~~ bacterial-induced response on the at least one chromatophore;

exposing a combination of the at least one chromatophore and the ~~test cell~~ bacteria to the bioactive compound;

exposing the combination to a control compound selected based on a control response produced on the chromatophore;

determining a measured response of the chromatophore to the exposure of the combination to the control compound; and

evaluating the bioactive compound based on a difference in the measured response, the ~~cell induced~~ bacterial-induced response, and the control response.

Claim 26 (Canceled).

27. (Original) The method of claim 26, wherein the control compound is norepinephrine.

28. (New) The method according to claim 1 where the capsules are cartridges.

29. (New) The method according to claim 1 where the capsules are sealed containers.

30. (New) The method according to claim 1 where the capsules are beads.

31. (New) The method according to claim 1 where the capsules are formed from glass or polymeric material.

32. (New) The method according to claim 31 where the polymeric material is alginate.

33. (New) A method for detecting a bioactive compound or organism, comprising:

exposing Betta chromatophores in a first optical state to the bioactive compound or organism; and

detecting an optical change in at least one Betta chromatophore from the first optical state to a second optical state in response to the bioactive compound or organism.

34. (New) The method according to claim 33 where exposing comprises exposing two or more classes of Betta splendens chromatophores to the bioactive compound or organism.

35. (New) The method according to claim 34 where the Betta splendens chromatophores are isolated chromatophores.

36. (New) The method according to claim 33 and further comprising exposing the bioactive compound or organism to chromatophores in addition to the Betta chromatophores.

37. (New) A method for detecting a bioactive compound or organism, comprising:

exposing isolated chromatophores to a bioactive compound or organism; and

quantifying a scalar optical change in at least one chromatophore in response to the bioactive compound.

38. (New) A method for detecting a bioactive compound or organism, comprising:

providing capsules comprising two or more types of isolated, primary Betta splendens chromatophores;

introducing the chromatophores into the capsules to commingle the bioactive compound or organism with the chromatophores; and

detecting a scalar optical change in at least one chromatophore in response to the bioactive compound or organism.

39. (New) The method according to claim 38 where detecting the scalar optical change comprises computer aided detection.